

Appl. No. 10/624,907
Reply to Office Action dated Oct 6, 2004
Response dated November 16, 2004

IN THE CLAIMS

Please amend the claims to read as follows (added matter is underlined and omitted matter has strikethrough):

- 1. (Currently Amended) A vortex induced vibration suppression apparatus comprising;
- a) an elongated one piece body of flexible polymeric material, the body having a wall surrounding a continuous, open ended bore;
 - b) a plurality of helical vanes on the body wall and extending along the length thereof;
 - c) a ~~Δ~~ longitudinally extending slot that enables the body wall to be pulled apart at first and second longitudinally extending edges;
 - d) a pipe section that carries the body, the riser pipe section occupying the bore;
 - e) a plurality of transverse openings in the vanes that are positioned at circumferentially spaced positions of the wall; and
 - f) a tensionable strap that can be removably applied to the body for holding the body to the pipe section, wherein the strap follows an annular path that extends through a single opening of each of the vanes.
2. (Original) The vortex induced vibration suppression apparatus of claim 1 further comprising a longitudinal slot that extends through the wall, enabling the body to be separated to afford access to the bore.
3. (Original) The vortex induced vibration suppression apparatus of claim 2 wherein the slot extends longitudinally in between two of the vanes.
4. (Original) The vortex induced vibration suppression apparatus of claim 2 wherein the slot is a helically shaped slot.
5. (Original) The vortex induced vibration suppression apparatus of claim 2 wherein there are a plurality of said straps that hold the body to the pipe section at spaced apart longitudinal intervals.
6. (Original) The vortex induced vibration suppression apparatus of claim 1 wherein the body is of a polyurethane material.
7. (Original) The vortex induced vibration suppression apparatus of claim 1 wherein

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the body is between 50 and 95 Shore A durometer.

8. (Original) The vortex induced vibration suppression apparatus of claim 1 wherein the body is between 50 and 75 Shore D durometer.

9. (Original) The vortex induced vibration suppression apparatus of claim 5 wherein each strap is a removable, connectable member.

10. (Original) The vortex induced vibration suppression apparatus of claim 1 wherein the slot tracks a helical path that coincides generally with a path tracked by each vane.

11. (Original) The vortex induced vibration suppression apparatus of claim 10 wherein there is a removable connection that holds the vane sections together at the slot.

12. (Currently Amended) A vortex induced vibration suppression apparatus comprising;
a) an elongated body of flexible polymeric material, the body having a wall surrounding a continuous, open ended bore;

b) a plurality of helical vanes on the body extending along the length thereof;

c) a longitudinal slot that extends through the wall, enabling the body to be separated at two provided wall edges to afford access to the bore;

d) ~~a~~ [★] plurality of openings through the vanes, said openings being spaced apart longitudinally on each vane and generally aligned transversely in multiples, each of said multiples on a different vane; and

c) straps that extend through the openings and hold the body wall edges together on a pipe section.

13. (Currently Amended) A method of installing a pipeline having a vortex induced suppression devices thereon, comprising the steps of:

a) mounting one or more polymeric vortex induced vibration suppression device ~~devices~~ on a joint of pipe to be part of the pipeline, each device including a generally cylindrically shaped wall with helical vanes thereon surrounding a continuous, open ended bore and a wall slot enabling the wall to be opened to afford access to the bore so that the device can be mounted on the pipeline via the slot;

b) making up the pipeline on a pipeline lay barge having a stinger;

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c) ~~wherein~~ ~~Wherein~~ before step "b d" each suppression device is attached to the pipeline with straps that each completely encircle the suppression device and that each extend through openings in the vanes;

d) lowering the riser and its vortex induced vibration suppression devices to the seabed by passing the riser and vortex induced vibration suppression devices over a stinger part of the barge.

14. (Currently Amended) A method of placing a pipeline section in an offshore marine environment, comprising the steps of:

a) providing a pipe laying barge that enables several pipe joints to be connected together end to end to form a pipeline, the pipe laying barge having a stinger that supports the pipe when the pipeline assumes a curved shape as it is lowered from the barge toward the seabed;

b) welding several joints of pipe together on the barge;

c) lowering the pipeline section from the barge to the seabed, wherein the stinger supports the pipeline section as it leaves the barge to enter the water;

d) placing one or more polymeric vortex induced vibration suppression devices on the pipeline section before it is lowered to the seabed from the barge, each suppression device having a wall that has a longitudinal slot wall edge at the slot, multiple helical vanes, and multiple openings through the vanes at spaced apart locations;

e) ~~securing~~ ~~Securing~~ the suppression devices to the pipeline using tensile fasteners that encircle the suppression device and pass through multiple of the openings; and

f) wherein in step "d" the vortex induced vibration suppression device passes over the stinger.

15. (Original) The method of claim 14 further comprising the step of widening the slot during placement of the device on the pipeline section.

16. (Original) The method of claim 15 wherein the vortex induced suppression vibration devices are joined to the pipeline section in step "d" using multiple tensile fasteners for each device.

17. (Original) The method of claim 15 wherein the vortex induced vibration device is of a flexible material, and step "d" includes flexing the flexible material to widen the slot.

18. (Original) The method of claim 15 wherein the vortex induced vibration device is

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of a polymeric material, and step "d" includes flexing the polymeric material to widen the slot.

19. (Original) The method of claim 15 wherein the vortex induced vibration device is of a polyurethane material, and step "d" includes flexing the polyurethane material to widen the slot.

20. (Original) The method of claim 17 wherein the vortex induced vibration device is joined to the pipeline section in step "d" with tensioned straps that define said tensile members.

21. (Original) The method of claim 18 wherein the vortex induced vibration device is joined to the pipeline section in step "d" with tensioned straps that define said tensile members.

22. (Original) The method of claim 19 wherein the vortex induced vibration device is joined to the pipeline section in step "d" with tensioned straps that define said tensile members.

23. (Original) The method of claim 14 wherein the vortex induced vibration device is joined to the pipeline section in step "d" with tensioned straps that define said tensile members.

24. (Currently Amended) The method of claim 13 further comprising the step of adding copper nickel particulate to the strake.

25. (Original) The method of claim 14 further comprising the step of adding copper nickel particulate to the strake.